

SEQUENCE LISTING

<110> Sim, Gek-Kee
 Yang, Shumin
 Sellins, Karen S.

<120> NOVEL FORMS OF T CELL COSTIMULATORY PROTEINS, NUCLEIC
 ACID MOLECULES, AND USES THEREOF

<130> IM-1-C1-PCT

<140> not yet assigned

<141> 1999-03-19

<150> 60/078,765

<151> 1998-03-19

<150> 09/062,597

<151> 1998-04-17

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<170> PatentIn Ver. 2.0

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135

140

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Thr Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys Ser

145

150

155

tcc ata caa ggt tac cca gaa ccc aag gag atg tat ttt ttg gta aaa 530

Ser Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Leu Val Lys

160

165

170

175

acc gag aat tca agt act aag tat gat act gtc atg aag aaa tct caa 578

Thr Glu Asn Ser Ser Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln

| 180 | 185 | 190 | |
|--|-----|-----|------|
| aat aat gtc aca gaa ctc tac aac gtt tct atc agc ttg tcc ttc tca | | | 626 |
| Asn Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Ser Phe Ser | | | |
| 195 | 200 | 205 | |
| gtc cct gaa gca agc aat gtg agc atc ttc tgt gtc ctg caa ctt gag | | | 674 |
| Val Pro Glu Ala Ser Asn Val Ser Ile Phe Cys Val Leu Gln Leu Glu | | | |
| 210 | 215 | 220 | |
| tca atg aag ctt ccc tcc cta cct tat aat ata gat gca cat acg aaa | | | 722 |
| Ser Met Lys Leu Pro Ser Leu Pro Tyr Asn Ile Asp Ala His Thr Lys | | | |
| 225 | 230 | 235 | |
| ccc acc cct gat gga gac cac atc ctc tgg att gcg gct ctg ctt gta | | | 770 |
| Pro Thr Pro Asp Gly Asp His Ile Leu Trp Ile Ala Ala Leu Leu Val | | | |
| 240 | 245 | 250 | 255 |
| atg ttg gtc att ttg tgt ggg atg gtg ttc ttt cta aca cta agg aaa | | | 818 |
| Met Leu Val Ile Leu Cys Gly Met Val Phe Phe Leu Thr Leu Arg Lys | | | |
| 260 | 265 | 270 | |
| agg aag aag aag cag cct ggc ccc tct cat gaa tgt gaa acc aac aaa | | | 866 |
| Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr Asn Lys | | | |
| 275 | 280 | 285 | |
| gtg gag aga aaa gaa agt gag cag acc aag gaa aga gta cgg tac cat | | | 914 |
| Val Glu Arg Lys Glu Ser Glu Gln Thr Lys Glu Arg Val Arg Tyr His | | | |
| 290 | 295 | 300 | |
| gaa acg gaa aga tct gat gaa gcc cag tgt gtt aac att tcg aag aca | | | 962 |
| Glu Thr Glu Arg Ser Asp Glu Ala Gln Cys Val Asn Ile Ser Lys Thr | | | |
| 305 | 310 | 315 | |
| gct tca ggc gac aac agt act aca cag ttt taattaaaga gtaaagtcca | | | 1012 |
| Ala Ser Gly Asp Asn Ser Thr Thr Gln Phe | | | |
| 320 | 325 | | |
| tccattgttt atatgccttc cctttcaaata tttggcttgc ctttttctcg tccattaata | | | 1072 |
| ttattattgc cactaataat aagaggcttt ccagggtccc ctctaaatga gagagcctcc | | | 1132 |
| ctataatgcc agttctgctc cctacaccag gagcagattt taactgcttc tttcatctc | | | 1192 |
| agagcacact tgtgggccat gctcacctga ctggctcctg gctcaggaat aatgtttaag | | | 1252 |
| actaacacct cctgtttcag attcagcctt cttttcttaa ttttatacat tgtgttttat | | | 1312 |

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<212> PRT

<213> Canis familiaris

<400> 7

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| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Leu | Leu | Leu | Tyr | Gly | Ala | Ala | Ser | Met | Lys | Ser | Gln | Ala | Tyr | Phe |
| | | | 20 | | | | | 25 | | | | | 30 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Lys | Thr | Gly | Glu | Leu | Pro | Cys | His | Phe | Thr | Asn | Ser | Gln | Asn | Ile |
| | | | 35 | | | | 40 | | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Leu | Asp | Glu | Leu | Val | Val | Phe | Trp | Gln | Asp | Gln | Asp | Lys | Leu | Val |
| | 50 | | | | | 55 | | | | | 60 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Tyr | Glu | Leu | Tyr | Arg | Gly | Lys | Glu | Asn | Pro | Gln | Asn | Val | His | Arg |
| 65 | | | | | 70 | | | | 75 | | | | | 80 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Tyr | Lys | Gly | Arg | Thr | Ser | Phe | Asp | Lys | Asp | Asn | Trp | Thr | Leu | Arg |
| | | | 85 | | | | | | 90 | | | | | 95 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | His | Asn | Ile | Gln | Ile | Lys | Asp | Lys | Gly | Leu | Tyr | Gln | Cys | Phe | Val |
| | | | 100 | | | | | 105 | | | | | 110 | | |

His His Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met Asn Ser
 115 120 125
 Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Met Val Thr
 130 135 140
 Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys Ser Ser
 145 150 155 160
 Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Leu Val Lys Thr
 165 170 175
 Glu Asn Ser Ser Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln Asn
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 Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Ser Phe Ser Val
 195 200 205
 Pro Glu Ala Ser Asn Val Ser Ile Phe Cys Val Leu Gln Leu Glu Ser
 210 215 220
 Met Lys Leu Pro Ser Leu Pro Tyr Asn Ile Asp Ala His Thr Lys Pro
 225 230 235 240
 Thr Pro Asp Gly Asp His Ile Leu Trp Ile Ala Ala Leu Leu Val Met
 245 250 255
 Leu Val Ile Leu Cys Gly Met Val Phe Phe Leu Thr Leu Arg Lys Arg
 260 265 270
 Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr Asn Lys Val
 275 280 285
 Glu Arg Lys Glu Ser Glu Gln Thr Lys Glu Arg Val Arg Tyr His Glu
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<211> 1897

<212> DNA

<213> Canis familiaris

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<211> 987

<212> DNA

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 aagtataagg gccgcacaag ctttgacaaa gacaattgga ccttgagact ccataatatt 300
 cagatcaagg acaagggtt gtatcaatgt ttcgttcac ataaagggcc caaaggactc 360
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 tctatcagct tgccttctc agtccctgaa gcaagcaatg tgagcatctt ctgtgtcctg 660
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 catgaatgtg aaaccaacaa agtggagaga aaagaaagtg agcagaccaa ggaaagagta 900
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 tagtgttaga aagaacacca tcccacacaa aatgaccaac attacaagca gagccgcaat 240
 ccagaggatg tggctcccat caggggtggg ttctgtatgt gcatctatat tataaggtag 300
 ggaggggaagc ttcattgact caagttgcag gacacagaag atgctcacat tgcttgcttc 360
 agggactgag aaggacaagc tgatagaaac gttgtagagt tctgtgacat tattttgaga 420
 tttcttcatg acagtatcat acttagtact tgaattctcg gtttttacca aaaaatacat 480
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<211> 1024

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<213> Canis familiaris

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| tcagcagcag | cagaagcc | atg | gat | tac | aca | gcg | aag | tgg | aga | aca | cca | cca | 111 |
| | | Met | Asp | Tyr | Thr | Ala | Lys | Trp | Arg | Thr | Pro | Pro | |
| | | 1 | | | | 5 | | | | | 10 | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ctc | aaa | cac | cca | tat | ctc | aag | gtc | tct | cag | ctc | ttg | gtg | cta | gct | agt | 159 |
| Leu | Lys | His | Pro | Tyr | Leu | Lys | Val | Ser | Gln | Leu | Leu | Val | Leu | Ala | Ser | |
| | | 15 | | | | 20 | | | | | 25 | | | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ctc | ttt | tac | ttc | tgt | tca | ggc | atc | atc | cag | gtg | aac | aag | aca | gtg | aaa | 207 |
| Leu | Phe | Tyr | Phe | Cys | Ser | Gly | Ile | Ile | Gln | Val | Asn | Lys | Thr | Val | Lys | |
| | 30 | | | | | 35 | | | | | 40 | | | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gaa | gta | gca | gta | ctg | tcc | tgt | gat | tac | aac | att | tcc | act | aca | gaa | ctg | 255 |
| Glu | Val | Ala | Val | Leu | Ser | Cys | Asp | Tyr | Asn | Ile | Ser | Thr | Thr | Glu | Leu | |
| | 45 | | | | | 50 | | | | | 55 | | | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| atg | aaa | gtt | cga | atc | tat | tgg | caa | aag | gat | gat | gaa | gtg | gtg | ctg | gct | 303 |
| Met | Lys | Val | Arg | Ile | Tyr | Trp | Gln | Lys | Asp | Asp | Glu | Val | Val | Leu | Ala | |
| | 60 | | | | 65 | | | | 70 | | | | | 75 | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gtc | aca | tct | gga | caa | acg | aaa | gtg | tgg | tcc | aag | tat | gag | aat | cgc | acc | 351 |
| Val | Thr | Ser | Gly | Gln | Thr | Lys | Val | Trp | Ser | Lys | Tyr | Glu | Asn | Arg | Thr | |
| | | | 80 | | | | | 85 | | | | | | 90 | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ttt | gct | gac | ttc | acc | aat | aac | ctc | tcc | atc | gtg | att | atg | gct | ctg | cgc | 399 |
| Phe | Ala | Asp | Phe | Thr | Asn | Asn | Leu | Ser | Ile | Val | Ile | Met | Ala | Leu | Arg | |
| | | | 95 | | | | 100 | | | | | | 105 | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ctg | tca | gac | aat | ggc | aaa | tac | acc | tgt | atc | gtt | caa | aag | act | gaa | aaa | 447 |
| Leu | Ser | Asp | Asn | Gly | Lys | Tyr | Thr | Cys | Ile | Val | Gln | Lys | Thr | Glu | Lys | |
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gct gac ttc cct gtc cct agt ata act gac ctt gga aat cca tcc cat 543
Ala Asp Phe Pro Val Pro Ser Ile Thr Asp Leu Gly Asn Pro Ser His
140 145 150 155

gac atc aaa agg ata atg tgt tca acc tct gga ggt ttt cca aag cct 591
Asp Ile Lys Arg Ile Met Cys Ser Thr Ser Gly Gly Phe Pro Lys Pro
160 165 170

cac ctc tcc tgg tgg gaa aat gaa gaa gaa ttg aat gct gcc aac aca 639
His Leu Ser Trp Trp Glu Asn Glu Glu Glu Leu Asn Ala Ala Asn Thr
175 180 185

aca gtt tcc caa gac ccg gac act gag ttg tac act att agt agt gaa 687
Thr Val Ser Gln Asp Pro Asp Thr Glu Leu Tyr Thr Ile Ser Ser Glu
190 195 200

ctg gat ttc aat ata aca agc aac cat agc ttt gtg tgt ctt gtc aag 735
Leu Asp Phe Asn Ile Thr Ser Asn His Ser Phe Val Cys Leu Val Lys
205 210 215

tat gga gac tta aca gta tca cag atc ttc aac tgg caa aaa tgt aag 783
Tyr Gly Asp Leu Thr Val Ser Gln Ile Phe Asn Trp Gln Lys Cys Lys
220 225 230 235

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 100 105 110
 Lys Tyr Thr Cys Ile Val Gln Lys Thr Glu Lys Arg Ser Tyr Lys Val
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 Lys His Met Thr Ser Val Met Leu Leu Val Arg Ala Asp Phe Pro Val
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 180 185 190
 Pro Asp Thr Glu Leu Tyr Thr Ile Ser Ser Glu Leu Asp Phe Asn Ile
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<213> Canis familiaris

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<211> 705

<212> DNA

<213> *Canis familiaris*

<400> 14

atggattaca cagcgaagtg gagaacacca ccaactcaaac acccatatct caaggctctt 60
cagctcttgg tgctagctag tctcttttac ttctgttcag gcatcatcca ggtgaacaag 120

acagtgaaag aagtagcagt actgtcctgt gattacaaca tttccactac agaactgatg 180
 aaagttcgaa tctattggca aaaggatgat gaagtgggtc tggctgtcac atctggacaa 240
 acgaaagtgt ggtccaagta tgagaatcgc acctttgctg acttcaccaa taacctctcc 300
 atcgtgatta tggctctgcg cctctcagac aatggcaaata acacctgtat cgttcaaaaag 360
 actgaaaaaa ggtctttacaa agtgaaacac atgacttcgg tgatgttatt ggtcagagct 420
 gacttccttg tccctagtat aactgacctt ggaaatccat cccatgacat caaaaggata 480
 atgtgttcaa cctctggagg ttttccaaag cctcacctct cctgggtggga aaatgaagaa 540
 gaattgaatg ctgccaacac aacagtttcc caagaccggg aactgagtt gtacactatt 600
 agtagtgaac tggatttcaa tataacaagc aaccatagct ttgtgtgtct tgtcaagtat 660
 ggagacttaa cagtatcaca gatcttcaac tggcaaaaat gtaag 705

<210> 15

<211> 705

<212> DNA

<213> *Canis familiaris*

<400> 15

cttacatttt tgccagttga agatctgtga tactgttaag tctccatact tgacaagaca 60
 cacaaagcta tggttgcttg ttatattgaa atccagttca ctactaatag tgtacaactc 120
 agtgtccggg tcttgggaaa ctgttgtgtt ggcagcattc aattcttctt cattttccca 180
 ccaggagagg tgaggctttg gaaaacctcc agaggttgaa cacattatcc ttttgatgtc 240
 atgggatgga tttccaaggt cagttatact agggacaggg aagtcagctc tgaccaataa 300
 catcaccgaa gtcattgtgtt tcactttgta agaccttttt tcagtctttt gaacgataca 360
 ggtgtatttg ccattgtctg acaggcgcag agccataatc acgatggaga ggttattggg 420
 gaagtcagca aaggtgcatg tctcactatt ggaccacact ttcgtttgtc cagatgtgac 480
 agccagcacc acttcatcat ccttttgcca atagattoga actttcatca gttctgtagt 540
 ggaaatgttg taatcacagg acagtactgc tacttctttc actgtcttgt tcacctggat 600
 gatgcctgaa cagaagtaaa agagactagc tagcaccaag agctgagaga ccttgagata 660

tgggtgtttg agtggtggtg ttctccactt cgctgtgtaa tccat

705

<210> 16

<211> 1795

<212> DNA

<213> Canis familiaris

<220>

<221> CDS

<222> (7)..(846)

<400> 16

gccaag atg tat ctc aga tgc act atg gaa ctg aat aac att ctc ttt 48
Met Tyr Leu Arg Cys Thr Met Glu Leu Asn Asn Ile Leu Phe
1 5 10

gtg atg acc ctc ctg ctc tat ggt gct gct tcc atg aag agt caa gca 96
Val Met Thr Leu Leu Leu Tyr Gly Ala Ala Ser Met Lys Ser Gln Ala
15 20 25 30

tat ttc aac aag act gga gaa ctg cca tgc cat ttt aca aat tct caa 144
Tyr Phe Asn Lys Thr Gly Glu Leu Pro Cys His Phe Thr Asn Ser Gln
35 40 45

aac ata agc ctg gat gag ttg gta gtg ttt tgg cag gac cag gat aag 192
Asn Ile Ser Leu Asp Glu Leu Val Val Phe Trp Gln Asp Gln Asp Lys
50 55 60

ctg gtt ctg tac gag cta tac aga ggc aaa gag aac cct caa aat gtt 240
Leu Val Leu Tyr Glu Leu Tyr Arg Gly Lys Glu Asn Pro Gln Asn Val
65 70 75

cat cgc aag tat aag ggc cgc aca agc ttt gac aaa gac aat tgg acc 288
His Arg Lys Tyr Lys Gly Arg Thr Ser Phe Asp Lys Asp Asn Trp Thr
80 85 90

ctg aga ctc cat aat att cag atc aag gac aag ggc ttg tat caa tgt 336
Leu Arg Leu His Asn Ile Gln Ile Lys Asp Lys Gly Leu Tyr Gln Cys
95 100 105 110

ttc gtt cat cat aaa ggg ccc aaa gga ctc gtt ccc atg cac cag atg 384
Phe Val His His Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met
115 120 125

aat tct gac cta tca gtg ctt gct aac ttc agt caa cct gaa ata atg 432
Asn Ser Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Met

| 130 | 135 | 140 | |
|--|-----|-----|------|
| gta act tct aat aga aca gaa aat tct ggc atc ata aat ttg acc tgc | | | 480 |
| Val Thr Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys | | | |
| 145 | 150 | 155 | |
| tca tcc ata caa ggt tac cca gaa ccc aag gag atg tat ttt ttg gta | | | 528 |
| Ser Ser Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Leu Val | | | |
| 160 | 165 | 170 | |
| aaa acc gag aat tca agt act aag tat gat act gtc atg aag aaa tct | | | 576 |
| Lys Thr Glu Asn Ser Ser Thr Lys Tyr Asp Thr Val Met Lys Lys Ser | | | |
| 175 | 180 | 185 | 190 |
| caa aat aat gtc aca gaa ctc tac aac gtt tct atc agc ttg tcc ttc | | | 624 |
| Gln Asn Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Ser Phe | | | |
| 195 | 200 | 205 | |
| tca gtc cct gaa gca agc aat gtg agc atc ttc tgt gtc ctg caa ctt | | | 672 |
| Ser Val Pro Glu Ala Ser Asn Val Ser Ile Phe Cys Val Leu Gln Leu | | | |
| 210 | 215 | 220 | |
| gag tca atg aag ctt ccc tcc cta cct tat aat ata gaa acc aac aaa | | | 720 |
| Glu Ser Met Lys Leu Pro Ser Leu Pro Tyr Asn Ile Glu Thr Asn Lys | | | |
| 225 | 230 | 235 | |
| gtg gag aga aaa gaa agt gag cag acc aag gaa aga gta cgg tac cat | | | 768 |
| Val Glu Arg Lys Glu Ser Glu Gln Thr Lys Glu Arg Val Arg Tyr His | | | |
| 240 | 245 | 250 | |
| gaa acg gaa aga tct gat gaa gcc cag tgt gtt aac att tcg aag aca | | | 816 |
| Glu Thr Glu Arg Ser Asp Glu Ala Gln Cys Val Asn Ile Ser Lys Thr | | | |
| 255 | 260 | 265 | 270 |
| gct tca ggc gac aac agt act aca cag ttt taattaaaga gtaaagtcca | | | 866 |
| Ala Ser Gly Asp Asn Ser Thr Thr Gln Phe | | | |
| 275 | 280 | | |
| tccattgttt atatgccttc cctttcaaatt tttggcttgc ctttttctcg tccattaata | | | 926 |
| ttattattgc cactaataat aagaggcttt ccagggtccc ctctaaatga gagagcctcc | | | 986 |
| ctataatgcc agttctgctc cctacaccag gagcagattt taactgcttc ttttcatctc | | | 1046 |
| agagcacact tgtgggccat gctcacctga ctggctcctg gctcaggaat aatgtttaag | | | 1106 |
| actaacacct cctgtttcag attcagcctt cttttcttaa ttttatacat tgtgttttat | | | 1166 |

gtagaactcc caattactgg actaatggct tttatctatg cttaattcta agatagtgcc 1226
 tcattccatc ttgtatatatt gtgactacct ctgcagtctg ggtgggagtt ttgtatgtta 1286
 tggctttata gtgttgcttt aatattttga gacataaaga gatgtgtact ataataatgt 1346
 aattactatg ccctgagaaa attctaccca ctgctgagga gctcttgctc ctctgtgagg 1406
 gtcagtagca aaatggtggc ttggtgtgct gacaacaatg agcagaccaa ctcaaaattt 1466
 ggaagattag gaatgatgga gatagaacca gctctgagtc ctggagccac ttctatctgg 1526
 gctgctgcta atctgaggaa gatccacctg cctaacaagc tatggataag ccttagcagg 1586
 gagctctttg tgaagcagga aagcactatg cactgtgaac cctacttctc ttcttgaaaa 1646
 aaatggctga gatgatggct cagggcaact gttcaagagc caactgagag atcacaatac 1706
 ttaaaagaga aaaaagaaaa aagaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1766
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1795

<210> 17

<211> 280

<212> PRT

<213> *Canis familiaris*

<400> 17

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Tyr | Leu | Arg | Cys | Thr | Met | Glu | Leu | Asn | Asn | Ile | Leu | Phe | Val | Met |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Leu | Leu | Leu | Tyr | Gly | Ala | Ala | Ser | Met | Lys | Ser | Gln | Ala | Tyr | Phe |
| | | | 20 | | | | | 25 | | | | | 30 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Lys | Thr | Gly | Glu | Leu | Pro | Cys | His | Phe | Thr | Asn | Ser | Gln | Asn | Ile |
| | 35 | | | | | | 40 | | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Leu | Asp | Glu | Leu | Val | Val | Phe | Trp | Gln | Asp | Gln | Asp | Lys | Leu | Val |
| | 50 | | | | | 55 | | | | | 60 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Tyr | Glu | Leu | Tyr | Arg | Gly | Lys | Glu | Asn | Pro | Gln | Asn | Val | His | Arg |
| 65 | | | | | 70 | | | | 75 | | | | | | 80 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Tyr | Lys | Gly | Arg | Thr | Ser | Phe | Asp | Lys | Asp | Asn | Trp | Thr | Leu | Arg |
| | | | 85 | | | | | | 90 | | | | | 95 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | His | Asn | Ile | Gln | Ile | Lys | Asp | Lys | Gly | Leu | Tyr | Gln | Cys | Phe | Val |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

| | | |
|---|-----|-----|
| 100 | 105 | 110 |
| His His Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met Asn Ser | | |
| 115 | 120 | 125 |
| Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Met Val Thr | | |
| 130 | 135 | 140 |
| Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys Ser Ser | | |
| 145 | 150 | 155 |
| Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Leu Val Lys Thr | | |
| 165 | 170 | 175 |
| Glu Asn Ser Ser Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln Asn | | |
| 180 | 185 | 190 |
| Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Ser Phe Ser Val | | |
| 195 | 200 | 205 |
| Pro Glu Ala Ser Asn Val Ser Ile Phe Cys Val Leu Gln Leu Glu Ser | | |
| 210 | 215 | 220 |
| Met Lys Leu Pro Ser Leu Pro Tyr Asn Ile Glu Thr Asn Lys Val Glu | | |
| 225 | 230 | 235 |
| Arg Lys Glu Ser Glu Gln Thr Lys Glu Arg Val Arg Tyr His Glu Thr | | |
| 245 | 250 | 255 |
| Glu Arg Ser Asp Glu Ala Gln Cys Val Asn Ile Ser Lys Thr Ala Ser | | |
| 260 | 265 | 270 |
| Gly Asp Asn Ser Thr Thr Gln Phe | | |
| 275 | 280 | |

<210> 18

<211> 1795

<212> DNA

<213> Canis familiaris

<400> 18

tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt 60
 ttttttcttt tttttttttt ctcttttaag tattgtgatc tctcagttgg ctcttgaaca 120
 gttgccctga gccatcatct cagccatttt tttcaagaag agaagtaggg ttcacagtgc 180

atagtgcctt cctgcttcac aaagagctcc ctgctaaggc ttatccatag cttgttaggc 240
aggtggatct tcctcagatt agcagcagcc cagatagaag tggctccagg actcagagct 300
ggttctatct ccatcattcc taatcttcca aattttgagt tggctctgctc attgttgtca 360
gcacaccaag ccaccatttt cgtactgacc ctcacagagg agcaagagct cctcagcagt 420
gggtagaatt ttctcagggc atagtaatta cattattata gtacacatct ctttatgtct 480
caaaatatta aagcaacact ataaagccat aacatacaaa actcccaccc agactgcaga 540
ggtagtcaca aatatacaag atggaatgag gcactatctt agaattaagc atagataaaa 600
gccattagtc cagtaattgg gagttctaca taaaacacaa tgtataaaat taagaaaaga 660
aggctgaatc tgaaacagga ggtgttagtc ttaaacatta ttcttgagcc aggagccagt 720
caggtgagca tggcccacaa gtgtgctctg agatgaaaag aagcagttaa aatctgctcc 780
tgggtgtaggg agcagaactg gcattatagg gaggtctctc catttagagg gagccctgga 840
aagcctctta ttattagtgg caataataat attaattggac gagaaaaagg caagccaaaa 900
tttgaaaggg aaggcatata aacaatggat ggactttact ctttaattaa aactgtgtag 960
tactgttgtc gcctgaagct gtcttcgaaa tgtaaacaca ctgggcttca tcagatcttt 1020
ccgtttcatg gtaccgtact ctttccttgg tctgctcact ttcttttctc tccactttgt 1080
tggtttctat attataaggt agggagggaa gcttcattga ctcaagttgc aggacacaga 1140
agatgctcac attgcttgct tcagggactg agaaggacaa gctgatagaa acgttgtaga 1200
gttctgtgac attattttga gattttcttca tgacagtatc atacttagta cttgaattct 1260
cggtttttac caaaaaatac atctccttgg gttctgggta accttgatg gatgagcagg 1320
tcaaatttat gatgccagaa ttttctgttc tattagaagt taccattatt tcaggttgac 1380
tgaagttagc aagcactgat aggtcagaat tcctctggtg catgggaacg agtccttttg 1440
gccctttatg atgaacgaaa cattgataca agcccttgct cttgatctga atattatgga 1500
gtctcagggc ccaattgtct ttgtcaaagc ttgtgcggcc cttatacttg cgatgaacat 1560
tttgagggtt ctctttgcct ctgtatagct cgtacagaac cagcttatcc tggtcctgcc 1620

aaaacactac caactcatcc aggcattatgt ttgagaatt tgtaaaatgg catggcagtt 1680
ctccagtctt gttgaaatat gcttgactct tcatggaagc agcaccatag agcaggaggg 1740
tcatcacaaa gagaatgtta ttcagttcca tagtgcactc gagatacatc ttggc 1795

<210> 19
<211> 840
<212> DNA
<213> *Canis familiaris*

<400> 19
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tatgggtgctg cttccatgaa gagtcaagca tatttcaaca agactggaga actgccatgc 120
cattttacaa attctcaaaa cataagcctg gatgagttgg tagtgttttg gcaggaccag 180
gataagctgg ttctgtacga gctatacaga ggcaaagaga accctcaaaa tgttcatcgc 240
aagtataagg gccgcacaag ctttgacaaa gacaattgga ccctgagact ccataatatt 300
cagatcaagg acaagggctt gtatcaatgt ttcgttcac ataaagggcc caaaggactc 360
gttcccatgc accagatgaa ttctgaccta tcagtgcttg ctaacttcag tcaacctgaa 420
ataatggtaa cttctaatag aacagaaaat tctggcatca taaatttgac ctgctcatcc 480
atacaagggt acccagaacc caaggagatg tattttttgg taaaaaccga gaattcaagt 540
actaagtatg atactgtcat gaagaaatct caaaataatg tcacagaact ctacaacgtt 600
tctatcagct tgtccttctc agtccctgaa gcaagcaatg tgagcatctt ctgtgtcctg 660
caacttgagt caatgaagct tccctcccta ccttataata tagaaaccaa caaagtggag 720
agaaaagaaa gtgagcagac caaggaaaga gtacggtacc atgaaacgga aagatctgat 780
gaagcccagt gtgttaacat ttcgaagaca gcttcaggcg acaacagtac tacacagttt 840

<210> 20
<211> 840
<212> DNA
<213> *Canis familiaris*

<400> 20

aaactgtgta gtactgttgt cgctgaagc tgtcttcgaa atgttaacac actgggcttc 60
 atcagatctt tccgtttcat ggtaccgtac tctttccttg gtctgtcac tttcttttct 120
 ctccactttg ttggtttcta tattataagg tagggaggga agcttcattg actcaagttg 180
 caggacacag aagatgctca cattgcttgc ttcagggact gagaaggaca agctgataga 240
 aacgttgtag agttctgtga cattatcttg agatttcttc atgacagtat catacttagt 300
 acttgaattc tcggttttta ccaaaaaata catctccttg gggtctgggt aaccttgat 360
 ggatgagcag gtcaaattta tgatgccaga attttctgtt ctattagaag ttaccattat 420
 ttcagggtga ctgaagttag caagcactga taggtcagaa ttcattctgt gcattgggaac 480
 gagtcctttg ggccctttat gatgaacgaa acattgatac aagcccttgt ccttgatctg 540
 aatattatgg agtctcaggg tccaattgtc tttgtcaaag cttgtgcggc ccttatactt 600
 gcgatgaaca ttttgagggt tctctttgcc tctgtatagc tcgtacagaa ccagcttata 660
 ctggtcctgc caaaacacta ccaactcatc caggcttatg ttttgagaat ttgtaaaatg 720
 gcattggcagt tctccagtct tgttgaaata tgcttgactc ttcattggaag cagcaccata 780
 gagcaggagg gtcattcaca agagaatggt attcagttcc atagtgcac tgagatacat 840

<210> 21

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 21

gtcaragctg acttcctt

18

<210> 22

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 22

gtagaaactc ctcagaacaa tg

22

<210> 23

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 23

gtagtatattt ggcaggacc

19

<210> 24

<211> 23

<212> DNA

<213> Canis familiaris

<400> 24

tagaygsgca ggtcaaattt atg

23

<210> 25

<211> 2830

<212> DNA

<213> Felis catus

<220>

<221> CDS

<222> (179)..(1174)

<400> 25

gtttttttttt ttttgagttc tagtctcagc cctgacatta tttctttctc tacaaagagt 60

gtaggaagt tatggggagc tcacaaaggc tctcatcgt ttattcttaa caccttgttt 120

ctgtgttcct cggaatgct actgagctta tacatctggt ctctgggagc tgcagtgg 178

atg ggc att tgt gac agc act atg gga ctg agt cac act ctc ctt gtg 226
Met Gly Ile Cys Asp Ser Thr Met Gly Leu Ser His Thr Leu Leu Val

1

5

10

15

| | |
|---|-----|
| atg gcc ctc ctg ctc tct ggt gtt tct tcc atg aag agt caa gca tat | 274 |
| Met Ala Leu Leu Leu Ser Gly Val Ser Ser Met Lys Ser Gln Ala Tyr | |
| 20 25 30 | |
| ttc aac aag act gga gaa ctg cca tgc cat ttt aca aac tct caa aac | 322 |
| Phe Asn Lys Thr Gly Glu Leu Pro Cys His Phe Thr Asn Ser Gln Asn | |
| 35 40 45 | |
| ata agc ctg gat gag ctg gta gta ttt tgg cag gac cag gat aag ctg | 370 |
| Ile Ser Leu Asp Glu Leu Val Val Phe Trp Gln Asp Gln Asp Lys Leu | |
| 50 55 60 | |
| gtt ctg tat gag ata ttc aga ggc aaa gag aac cct caa aat gtt cat | 418 |
| Val Leu Tyr Glu Ile Phe Arg Gly Lys Glu Asn Pro Gln Asn Val His | |
| 65 70 75 80 | |
| ctc aaa tat aag ggc cgt aca agc ttt gac aag gac aac tgg acc ctg | 466 |
| Leu Lys Tyr Lys Gly Arg Thr Ser Phe Asp Lys Asp Asn Trp Thr Leu | |
| 85 90 95 | |
| aga ctc cac aat gtt cag atc aag gac aag ggc aca tat cac tgt ttc | 514 |
| Arg Leu His Asn Val Gln Ile Lys Asp Lys Gly Thr Tyr His Cys Phe | |
| 100 105 110 | |
| att cat tat aaa ggg ccc aaa gga cta gtt ccc atg cac caa atg agt | 562 |
| Ile His Tyr Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met Ser | |
| 115 120 125 | |
| tct gac cta tca gtg ctt gct aac ttc agt caa cct gaa ata aca gta | 610 |
| Ser Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Thr Val | |
| 130 135 140 | |
| act tct aat aga aca gaa aat tct ggc atc ata aat ttg acc tgc tca | 658 |
| Thr Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys Ser | |
| 145 150 155 160 | |
| tct ata caa ggt tac cca gaa cct aag gag atg tat ttt cag cta aac | 706 |
| Ser Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu Asn | |
| 165 170 175 | |
| act gag aat tca act act aag tat gat act gtc atg aag aaa tct caa | 754 |
| Thr Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln | |
| 180 185 190 | |
| aat aat gtg aca gaa ctg tac aac gtt tct atc agc ttg cct ttt tca | 802 |
| Asn Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser | |
| 195 200 205 | |

gtc cct gaa gca cac aat gtg agc gtc ttt tgt gcc ctg aaa ctg gag 850
 Val Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu
 210 215 220

aca ctg gag atg ctg ctc tcc cta cct ttc aat ata gat gca caa cct 898
 Thr Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Asp Ala Gln Pro
 225 230 235 240

aag gat aaa gac cct gaa caa ggc cac ttc ctc tgg att gcg gct gta 946
 Lys Asp Lys Asp Pro Glu Gln Gly His Phe Leu Trp Ile Ala Ala Val
 245 250 255

ctt gta atg ttt gtt gtt ttt tgt ggg atg gtg tcc ttt aaa aca cta 994
 Leu Val Met Phe Val Val Phe Cys Gly Met Val Ser Phe Lys Thr Leu
 260 265 270

agg aaa agg aag aag aag cag cct ggc ccc tct cat gaa tgt gaa acc 1042
 Arg Lys Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr
 275 280 285

atc aaa agg gag aga aaa gag agc aaa cag acc aac gaa aga gta cca 1090
 Ile Lys Arg Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro
 290 295 300

tac cac gta cct gag aga tct gat gaa gcc cag tgt att aac att ttg 1138
 Tyr His Val Pro Glu Arg Ser Asp Glu Ala Gln Cys Ile Asn Ile Leu
 305 310 315 320

aag aca gcc tca ggc gac aaa agt act aca cat ttt taattaaaga 1184
 Lys Thr Ala Ser Gly Asp Lys Ser Thr Thr His Phe
 325 330

ataaagtcca tataactgtc cattgtttat atgcctttcc cttcaagttt tgggcttacc 1244

tttttttgtc tattaatatt attattacca ttaataatag tggaggttcc aggactccat 1304

ctgagaaagc caccctgtaa tgccagctct gctccctacc tcaggagcag accttaactg 1364

cttcttttca tttcagagca aatttgtgcg ccaagctcac ctgactggat cctggctcag 1424

gaataatggt taagactaac acctcctggt tcacattcag ccttcttttc ttaattttat 1484

aaattgcgtc ttatgtagaa ctcccaatta ctggaataat ggctttttatc tatgtaattc 1544

taaggtagtg cctcattcta tcttgtatat ttgtgactga ataactacct cttcagtctt 1604

gtgggagtta tatattttat ggcttttata gtattgctat taatatcttg aaacataaag 1664

agatgtgtac tataataatg taattactat gccctgagaa aatcactgct gaggagctct 1724
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 accaactcaa aatttggaaa attaagacca tgaagatgga atcagctctg gatcctggat 1844
 ccacttctat ctgggccctt gctaacctga gaaggatctg cctgcggaac aagctataga 1904
 taagccttag cagagaacac tgggtcaagc actgcatatt gtgaaccac ttctcttctt 1964
 gaaagaaatg actgagatga tgggtccagag caactatgca agagccaact gagagatcac 2024
 aacactcaaa agagaaaaaa aatgaaagat cttgacaaca gagatgcata tgaatgtcct 2084
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 ccatttgtgt gttcttcctt gcatttgctt cattaggcca taagcatctt gttggtttct 2744
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 aaaaaaaaaa aaaaaaaaaa aaaaaa 2830

<210> 26

<211> 332

<212> PRT

<213> Felis catus

<400> 26

Met Gly Ile Cys Asp Ser Thr Met Gly Leu Ser His Thr Leu Leu Val
 1 5 10 15
 Met Ala Leu Leu Leu Ser Gly Val Ser Ser Met Lys Ser Gln Ala Tyr
 20 25 30
 Phe Asn Lys Thr Gly Glu Leu Pro Cys His Phe Thr Asn Ser Gln Asn
 35 40 45
 Ile Ser Leu Asp Glu Leu Val Val Phe Trp Gln Asp Gln Asp Lys Leu
 50 55 60
 Val Leu Tyr Glu Ile Phe Arg Gly Lys Glu Asn Pro Gln Asn Val His
 65 70 75 80
 Leu Lys Tyr Lys Gly Arg Thr Ser Phe Asp Lys Asp Asn Trp Thr Leu
 85 90 95
 Arg Leu His Asn Val Gln Ile Lys Asp Lys Gly Thr Tyr His Cys Phe
 100 105 110
 Ile His Tyr Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met Ser
 115 120 125
 Ser Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Thr Val
 130 135 140
 Thr Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys Ser
 145 150 155 160
 Ser Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu Asn
 165 170 175
 Thr Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln
 180 185 190
 Asn Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser
 195 200 205
 Val Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu
 210 215 220
 Thr Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Asp Ala Gln Pro
 225 230 235 240
 Lys Asp Lys Asp Pro Glu Gln Gly His Phe Leu Trp Ile Ala Ala Val
 245 250 255

Leu Val Met Phe Val Val Phe Cys Gly Met Val Ser Phe Lys Thr Leu
 260 265 270
 Arg Lys Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr
 275 280 285
 Ile Lys Arg Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro
 290 295 300
 Tyr His Val Pro Glu Arg Ser Asp Glu Ala Gln Cys Ile Asn Ile Leu
 305 310 315 320
 Lys Thr Ala Ser Gly Asp Lys Ser Thr Thr His Phe
 325 330

<210> 27

<211> 2830

<212> DNA

<213> Felis catus

<400> 27

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 aaatgcaggg aagaacacac aaatggtaat attacaagga caagcatggc tagtacagct 180
 gtctacaacc ttctagattc ctttatgtag aataagaaga aatatttctg tgggttgggc 240
 ctcccaaagt tctctcttgg tttggactga ggctgcctcg tcccttagtg atgctgcttt 300
 agagccaggg tcatctgact catctctact gggctagtag agtcctctcg tgtaccagct 360
 ttcccatca tttataatga catatagaca gtctcagat ataaatttgc caccctgct 420
 cttggccagc tgatctctcc ctagggcacc tgccagctaa gttggccttt agatgattta 480
 catcttggtc ctctgattc cactctagct ctttgtgtct cagaagtaag ttgaaagagt 540
 cctaagcttc cttccattta tccattatc aagatgatag ctcttcctcc cctgctctgc 600
 ctgcagccag atgaaacatc acaataactt gattattatc caaacttctc accaaccacc 660
 atgggagctg ctgtctgtct taagtccttt tggacagact gtctacctgt tgctaattcc 720
 aaggtttgct agaggactgg acagacagga cattcatatg catctctggt gtcaagatct 780

ttcatttttt ttctcttttg agtggtgtga tctctcagtt ggctcttgca tagttgctct 840
 ggaccatcat ctcagtcatt tctttcaaga agagaagtgg gttcacaata tgcagtgctt 900
 gacccagtgt tctctgctaa ggcttatcta tagcttggtc cgcaggcaga tccttctcag 960
 gtttagcaagg gccagatag aagtggatcc aggatccaga gctgattcca tcttcatggt 1020
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 ttctactga tcttcacaga gggacaagag ctctcagca gtgattttct cagggcatag 1140
 taattacatt attatagtag acatctcttt atgtttcaag atattaatag caatactata 1200
 aaagccataa aatatataac tcccacaaga ctgaagaggt agttattcag tcacaaatat 1260
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 aataataata ttaatagaca aaaaaaggta agcccaaac ttgaagggaaggatataa 1620
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 ctccagtttc agggcacaaa agacgctcac attgtgtgct tcagggactg aaaaaggcaa 2040
 gctgatagaa acgttgtaca gttctgtcac attattttga gatttcttca tgacagtatc 2100
 atacttagta gttgaattct cagtgtttag ctgaaaatac atctccttag gttctgggta 2160
 accttgata gatgagcagg tcaaatttat gatgccagaa ttttctgttc tattagaagt 2220

tactgttatt tcaggttgac tgaagttagc aagcactgat aggtcagaac tcatttggtg 2280
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cttgatctga acattgtgga gtctcagggt ccagttgtcc ttgtcaaagc ttgtacggcc 2400
cttatatttg agatgaacat tttgagggtt ctctttgcct ctgaatatct catacagaac 2460
cagcttatcc tggtcctgcc aaaatactac cagctcatcc aggcttatgt tttgagagtt 2520
tgtaaaatgg catggcagtt ctccagttct gttgaaatat gcttgactct tcatggaaga 2580
aacaccagag agcaggaggg ccatacacaag gagagtgtga ctcagtccca tagtgctgtc 2640
acaaatgccc atccactgca gctcccagag accagatgta taagctcagt gacattccccg 2700
aggaacacag aaacaagggtg ttaagaataa acgatgagga gcctttgtga gctccccata 2760
acttcctaac actctttgta gagaaagaaa taatgtcagg gctgagacta gaactcaaaa 2820
aaaaaaaaaac 2830

<210> 28

<211> 996

<212> DNA

<213> Felis catus

<400> 28

atgggcattt gtgacagcac tatgggactg agtcacactc tccttgtgat ggccctcctg 60
ctctctggtg tttcttccat gaagagtcaa gcatatttca acaagactgg agaactgcca 120
tgccatttta caaactctca aaacataagc ctggatgagc tggtagtatt ttggcaggac 180
caggataagc tggttctgta tgagatattc agaggcaaag agaaccctca aaatgttcat 240
ctcaaatata agggccgtac aagctttgac aaggacaact ggaccctgag actccacaat 300
gttcagatca aggacaaggg cacatatcac tgtttcattc attataaagg gcccaaagga 360
ctagttccca tgcaccaaata gagttctgac ctatcagtgc ttgctaactt cagtcaacct 420
gaaataacag taacttctaa tagaacagaa aattctggca tcataaattt gacctgctca 480
tctatacaag gttaccaga acctaaggag atgtattttc agctaaacac tgagaattca 540
actactaagt atgatactgt catgaagaaa tctcaaaata atgtgacaga actgtacaac 600

gtttctatca gcttgccttt ttcagtcctt gaagcacaca atgtgagcgt cttttgtgcc 660
ctgaaactgg agacactgga gatgctgctc tccctacctt tcaatataga tgcacaacct 720
aaggataaag accctgaaca aggccacttc ctctggattg cggctgtact tgtaatgttt 780
gttggtttttt gtgggatggt gtcctttaa acactaagga aaaggaagaa gaagcagcct 840
ggcccctctc atgaatgtga aaccatcaaa agggagagaa aagagagcaa acagaccaac 900
gaaagagtac cataccacgt acctgagaga tctgatgaag cccagtgtat taacattttg 960
aagacagcct caggcgacaa aagtactaca cttttt 996

<210> 29

<211> 996

<212> DNA

<213> Felis catus

<400> 29

aaaatgtgta gtacttttgt cgcctgaggc tgtcttcaaa atgttaatac actgggcttc 60
atcagatctc tcaggtacgt ggtatggtac tctttcgttg gtctgtttgc tctcttttct 120
ctcccctttg atggtttcac attcatgaga ggggccaggc tgcttcttct tccctttcct 180
tagtgtttta aaggacacca tcccacaaaa aacaacaaac attacaagta cagccgcaat 240
ccagaggaag tggccttggt cagggtcttt atccttaggt tgtgcatcta tattgaaagg 300
tagggagagc agcatctcca gtgtctccag tttcagggca caaaagacgc tcacattgtg 360
tgcttcaggg actgaaaaag gcaagctgat agaaacgttg tacagttctg tcacattatt 420
ttgagatttc ttcatgacag tatcatactt agtagttgaa ttctcagtgt ttagctgaaa 480
atacatctcc ttaggttctg ggtaaccttg tatagatgag cagggtcaaatt ttatgatgcc 540
agaattttct gttctattag aagttactgt tatttcaggt tgactgaagt tagcaagcac 600
tgataggtca gaactcattt ggtgcatggg aactagtcct ttgggocctt tataatgaat 660
gaaacagtga tatgtgccct tgtccttgat ctgaacattg tggagtctca gggccagtt 720
gtccttgatca aagcttgtag ggcccttata tttagatga acattttgag gggtctcttt 780

gcctctgaat atctcataca gaaccagctt atcctgggtcc tgccaaaata ctaccagctc 840
 atccaggctt atgttttgag agtttgtaaa atggcatggc agttctccag tcttggtgaa 900
 atatgcttga ctcttcatgg aagaaacacc agagagcagg agggccatca caaggagagt 960
 gtgactcagt cccatagtgc tgtcacaaat gcccat 996

<210> 30
 <211> 509
 <212> DNA
 <213> Felis catus

<220>
 <221> CDS
 <222> (1)..(507)

<400> 30
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 1 5 10 15
 gag aat tca act act aag tat gat act gtc atg aag aaa tct caa aat 96
 Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln Asn
 20 25 30
 aat gtg aca gaa ctg tac aac gtt tct atc agc ttg cct ttt tca gtc 144
 Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser Val
 35 40 45
 cct gaa gca cac aat gtg agc gtc ttt tgt gcc ctg aaa ctg gag aca 192
 Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu Thr
 50 55 60
 ctg gag atg ctg ctc tcc cta cct ttc aat ata gat gca caa cct aag 240
 Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Asp Ala Gln Pro Lys
 65 70 75 80
 gat aaa gac cct gaa caa ggc cac ttc ctc tgg att gcg gct gta ctt 288
 Asp Lys Asp Pro Glu Gln Gly His Phe Leu Trp Ile Ala Ala Val Leu
 85 90 95
 gta atg ttt gtt gtt ttt tgt ggg atg gtg tcc ttt aaa aca cta agg 336
 Val Met Phe Val Val Phe Cys Gly Met Val Ser Phe Lys Thr Leu Arg
 100 105 110
 aaa agg aag aag aag cag cct ggc ccc tct cat gaa tgt gaa acc atc 384

Lys Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr Ile
 115 120 125
 aaa agg gag aga aaa gag agc aaa cag acc aac gaa aga gta cca tac 432
 Lys Arg Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro Tyr
 130 135 140
 cac gta cct gag aga tct gat gaa gcc cag tgt att aac att ttg aag 480
 His Val Pro Glu Arg Ser Asp Glu Ala Gln Cys Ile Asn Ile Leu Lys
 145 150 155 160
 aca gcc tca ggc gac aaa agt act aca ca 509
 Thr Ala Ser Gly Asp Lys Ser Thr Thr
 165

<210> 31
 <211> 169
 <212> PRT
 <213> Felis catus

<400> 31
 Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu Asn Thr
 1 5 10 15
 Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln Asn
 20 25 30
 Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser Val
 35 40 45
 Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu Thr
 50 55 60
 Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Asp Ala Gln Pro Lys
 65 70 75 80
 Asp Lys Asp Pro Glu Gln Gly His Phe Leu Trp Ile Ala Ala Val Leu
 85 90 95
 Val Met Phe Val Val Phe Cys Gly Met Val Ser Phe Lys Thr Leu Arg
 100 105 110
 Lys Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr Ile
 115 120 125
 Lys Arg Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro Tyr
 130 135 140

His Val Pro Glu Arg Ser Asp Glu Ala Gln Cys Ile Asn Ile Leu Lys
 145 150 155 160

Thr Ala Ser Gly Asp Lys Ser Thr Thr
 165

<210> 32
 <211> 509
 <212> DNA
 <213> Felis catus

<400> 32
 tgtgtagtac ttttgtcgcc tgaggctgtc ttcaaaatgt taatacactg ggcttcatca 60
 gatctctcag gtacgtggta tggctactctt tcgttggtct gtttgccttc tttctctctc 120
 cttttgatgg tttcacattc atgagagggg ccaggctgct tcttcttctt tttccttagt 180
 gttttaaaagg acaccatccc acaaaaaaca acaaacatta caagtacagc cgcaatccag 240
 aggaagtggc cttgttcagg gtctttatcc ttaggttggtg catctatatt gaaaggtagg 300
 gagagcagca tctccagtgt ctccagtttc agggcacaaa agacgctcac attgtgtgct 360
 tcagggactg aaaaaggcaa gctgatagaa acgttggtaca gttctgtcac attattttga 420
 gatttcttca tgacagtatc atacttagta gttgaattct cagtgttttag ctgaaaatac 480
 atctccttag gttctgggta accttgat 509

<210> 33
 <211> 359
 <212> DNA
 <213> Felis catus

<220>
 <221> CDS
 <222> (1)..(357)

<400> 33
 ata caa ggt tac cca gaa cct aag gag atg tat ttt cag cta aac act 48
 Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu Asn Thr
 1 5 10 15
 gag aat tca act act aag tat gat act gtc atg aag aaa tct caa aat 96

Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln Asn
 20 25 30

 aat gtg aca gaa ctg tac aac gtt tct atc agc ttg cct ttt tca gtc 144
 Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser Val
 35 40 45

 cct gaa gca cac aat gtg agc gtc ttt tgt gcc ctg aaa ctg gag aca 192
 Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu Thr
 50 55 60

 ctg gag atg ctg ctc tcc cta cct ttc aat ata gaa acc atc aaa agg 240
 Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Glu Thr Ile Lys Arg
 65 70 75 80

 gag aga aaa gag agc aaa cag acc aac gaa aga gta cca tac cac gta 288
 Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro Tyr His Val
 85 90 95

 cct gag aga tct gat gaa gcc cag tgt att aac att ttg aag aca gcc 336
 Pro Glu Arg Ser Asp Glu Ala Gln Cys Ile Asn Ile Leu Lys Thr Ala
 100 105 110

 tca ggc gac aaa agt act aca ca 359
 Ser Gly Asp Lys Ser Thr Thr
 115

<210> 34
 <211> 119
 <212> PRT
 <213> Felis catus

<400> 34
 Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu Asn Thr
 1 5 10 15

 Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln Asn
 20 25 30

 Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser Val
 35 40 45

 Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu Thr
 50 55 60

 Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Glu Thr Ile Lys Arg
 65 70 75 80

Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro Tyr His Val
 85 90 95

Pro Glu Arg Ser Asp Glu Ala Gln Cys Ile Asn Ile Leu Lys Thr Ala
 100 105 110

Ser Gly Asp Lys Ser Thr Thr
 115

<210> 35

<211> 359

<212> DNA

<213> Felis catus

<400> 35

tgtgtagtac ttttgtcgcc tgaggctgtc ttcaaaatgt taatacactg ggcttcatca 60
 gatctctcag gtacgtggta tgggtactctt tcgttgggtct gtttgcctctc ttttctctcc 120
 cttttgatgg tttctatatatt gaaaggtagg gagagcagca tctccagtgt ctccagtttc 180
 agggcacaaa agacgctcac attgtgtgct tcaggggactg aaaaaggcaa gctgatagaa 240
 acgttgtaca gttctgtcac attattttga gatttcttca tgacagtatc atacttagta 300
 gttgaattct cagtgttttag ctgaaaatac atctccttag gttctgggta accttgat 359

<210> 36

<211> 594

<212> DNA

<213> Felis catus

<220>

<221> CDS

<222> (1)..(522)

<400> 36

atg ggt cac gca gca aag tgg aaa aca cca cta ctg aag cac cca tat 48
 Met Gly His Ala Ala Lys Trp Lys Thr Pro Leu Leu Lys His Pro Tyr
 1 5 10 15

ccc aag ctc ttt ccg ctc ttg atg cta gct agt ctt ttt tac ttc tgt 96
 Pro Lys Leu Phe Pro Leu Leu Met Leu Ala Ser Leu Phe Tyr Phe Cys
 20 25 30

tca ggt atc atc cag gtg aac aag aca gtg gaa gaa gta gca gta cta 144
 Ser Gly Ile Ile Gln Val Asn Lys Thr Val Glu Glu Val Ala Val Leu
 35 40 45

tcc tgt gat tac aac att tcc acc aaa gaa ctg acg gaa att cga atc 192
 Ser Cys Asp Tyr Asn Ile Ser Thr Lys Glu Leu Thr Glu Ile Arg Ile
 50 55 60

tat tgg caa aag gat gat gaa atg gtg ttg gct gtc atg tct ggc aaa 240
 Tyr Trp Gln Lys Asp Asp Glu Met Val Leu Ala Val Met Ser Gly Lys
 65 70 75 80

gta caa gtg tgg ccc aag tac aag aac cgc aca ttc act gac gtc acc 288
 Val Gln Val Trp Pro Lys Tyr Lys Asn Arg Thr Phe Thr Asp Val Thr
 85 90 95

gat aac cac tcc att gtg atc atg gct ctg cgc ctg tca gac aat ggc 336
 Asp Ash His Ser Ile Val Ile Met Ala Leu Arg Leu Ser Asp Asn Gly
 100 105 110

aaa tac act tgt att att caa aag att gaa aaa ggg tct tac aaa gtg 384
 Lys Tyr Thr Cys Ile Ile Gln Lys Ile Glu Lys Gly Ser Tyr Lys Val
 115 120 125

aaa cac ctg act tcg gtg atg tta ttg gtc aga ggc gtc aca ccc agc 432
 Lys His Leu Thr Ser Val Met Leu Leu Val Arg Gly Val Thr Pro Ser
 130 135 140

aca gag ccc aat gcc cat gcg gag ctt gaa atc atg acc ctg aga tca 480
 Thr Glu Pro Asn Ala His Ala Glu Leu Glu Ile Met Thr Leu Arg Ser
 145 150 155 160

aga cct gag ctg aga tca aga gtc gga cgc tta atc gac tga 522
 Arg Pro Glu Leu Arg Ser Arg Val Gly Arg Leu Ile Asp
 165 170

gccacccagg catcccaatg atactttcta aataaaactct taaaaaaaaa aaaaaaaaaa 582

aaaaaaaaaa aa 594

<210> 37

<211> 173

<212> PRT .

<213> Felis catus

<400> 37

Met Gly His Ala Ala Lys Trp Lys Thr Pro Leu Leu Lys His Pro Tyr

1 5 10 15
 Pro Lys Leu Phe Pro Leu Leu Met Leu Ala Ser Leu Phe Tyr Phe Cys
 20 25 30
 Ser Gly Ile Ile Gln Val Asn Lys Thr Val Glu Glu Val Ala Val Leu
 35 40 45
 Ser Cys Asp Tyr Asn Ile Ser Thr Lys Glu Leu Thr Glu Ile Arg Ile
 50 55 60
 Tyr Trp Gln Lys Asp Asp Glu Met Val Leu Ala Val Met Ser Gly Lys
 65 70 75 80
 Val Gln Val Trp Pro Lys Tyr Lys Asn Arg Thr Phe Thr Asp Val Thr
 85 90 95
 Asp Asn His Ser Ile Val Ile Met Ala Leu Arg Leu Ser Asp Asn Gly
 100 105 110
 Lys Tyr Thr Cys Ile Ile Gln Lys Ile Glu Lys Gly Ser Tyr Lys Val
 115 120 125
 Lys His Leu Thr Ser Val Met Leu Leu Val Arg Gly Val Thr Pro Ser
 130 135 140
 Thr Glu Pro Asn Ala His Ala Glu Leu Glu Ile Met Thr Leu Arg Ser
 145 150 155 160
 Arg Pro Glu Leu Arg Ser Arg Val Gly Arg Leu Ile Asp
 165 170

<210> 38

<211> 594

<212> DNA

<213> Felis catus

<400> 38

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 tgccctgggtg gctcagtcga ttaagcgtcc gactcttgat ctcagctcag gtcttgatct 120
 cagggtcatg atttcaagct ccgcatgggc attgggctct gtgctgggtg tgacgcctct 180
 gaccaataac atcaccgaag tcagggtgtt cactttgtaa gacccttttt caatcttttg 240
 aataatacaa gtgtatttgc cattgtctga caggcgcaga gccatgatca caatggagtg 300

gttatcgggtg acgtcagtga atgtgcgggtt cttgtacttg ggccacactt gtactttgcc 360
agacatgaca gccaacacca tttcatcatc cttttgccaa tagattcgaa tttccgtcag 420
ttctttgggtg gaaatggtgt aatcacagga tagtactgct acttcttcca ctgtcttggt 480
cacctggatg atacctgaac agaagtaaaa aagactagct agcatcaaga gcgaaagag 540
cttgggatat ggggtgcttca gtagtggtgt tttccacttt gctgcgtgac ccat 594

<210> 39

<211> 519

<212> DNA

<213> Felis catus

<400> 39

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acagtggaag aagtagcagt actatcctgt gattacaaca tttccaccaa agaactgacg 180
gaaattcgaa tctattggca aaaggatgat gaaatggtgt tggctgtcat gtctggcaaa 240
gtacaagtgt ggcccaagta caagaaccgc acattcactg acgtcaccga taaccactcc 300
attgtgatca tggctctgag cctgtcagac aatggcaaata acacttgtat tattcaaaag 360
attgaaaaag ggtcttataa agtgaaacac ctgacttcgg tgatgttatt ggtcagaggc 420
gtcacacca gcacagagcc caatgcccac gcggagcttg aaatcatgac cctgagatca 480
agacctgagc tgagatcaag agtcggacgc ttaatcgac 519

<210> 40

<211> 519

<212> DNA

<213> Felis catus

<400> 40

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aagctccgca tgggcattgg gctctgtgct ggggtgtgacg cctctgacca ataacatcac 120
cgaagtcagg tgtttcactt tgtaagaccc tttttcaatc ttttgaataa tacaagtgta 180

ttgcccattg tctgacaggc gcagagccat gatcacaatg gagtggttat cggtgacgtc 240
 agtgaatgtg cggttcttgt acttggggcca cacttgtact ttgccagaca tgacagccaa 300
 caccatttca tcatcctttt gccaatagat tcgaatttcc gtcagttctt tgggtgaaat 360
 gttgtaatca caggatagta ctgctacttc ttccactgtc ttgttcacct ggatgatacc 420
 tgaacagaag taaaaaagac tagctagcat caagagcgga aagagcttgg gatatgggtg 480
 cttcagtagt ggtgttttcc actttgctgc gtgacccat 519

<210> 41

<211> 1856

<212> DNA

<213> *Canis familiaris*

<220>

<221> CDS

<222> (60)..(731)

<400> 41

caggatcctg aaaggtttca ctctgcttcc tgaagacctg aacactgctc cataaagcc 59

 atg gct ggc ttt gga ttc cgg agg cat ggg gct cag ccg gac ctg gct 107
 Met Ala Gly Phe Gly Phe Arg Arg His Gly Ala Gln Pro Asp Leu Ala
 1 5 10 15

 tct agg acc tgg ccc tgc act gct ctg ttt tct ctt ctc ttt atc ccc 155
 Ser Arg Thr Trp Pro Cys Thr Ala Leu Phe Ser Leu Leu Phe Ile Pro
 20 25 30

 gtc ttc tcc aaa ggg atg cat gtg gct cag cct gca gtg gtt ctg gcc 203
 Val Phe Ser Lys Gly Met His Val Ala Gln Pro Ala Val Val Leu Ala
 35 40 45

 agc agc cgg ggt gtt gct agc ttc gtg tgt gaa tat ggg tct tca ggc 251
 Ser Ser Arg Gly Val Ala Ser Phe Val Cys Glu Tyr Gly Ser Ser Gly
 50 55 60

 aac gca gcc gag gtc cgg gtg aca gtg ctg cgg cag gct ggc agc cag 299
 Asn Ala Ala Glu Val Arg Val Thr Val Leu Arg Gln Ala Gly Ser Gln
 65 70 75 80

 atg act gaa gtc tgt gcc gcg aca tac aca gtg gag gat gag ttg gcc 347
 Met Thr Glu Val Cys Ala Ala Thr Tyr Thr Val Glu Asp Glu Leu Ala

| 85 | 90 | 95 | |
|--|-----|-----|------|
| ttc ctg gat gat tct acc tgc acc ggc acc tcc agt gga aac aaa gtg | | | 395 |
| Phe Leu Asp Asp Ser Thr Cys Thr Gly Thr Ser Ser Gly Asn Lys Val | | | |
| 100 | 105 | 110 | |
| aac ctc acc atc caa ggg ttg agg gcc atg gac acg ggg ctc tac atc | | | 443 |
| Asn Leu Thr Ile Gln Gly Leu Arg Ala Met Asp Thr Gly Leu Tyr Ile | | | |
| 115 | 120 | 125 | |
| tgc aag gtg gag ctc atg tac cca cca ccc tac tat gta ggc atg gga | | | 491 |
| Cys Lys Val Glu Leu Met Tyr Pro Pro Pro Tyr Tyr Val Gly Met Gly | | | |
| 130 | 135 | 140 | |
| aat gga acc cag att tat gtc atc gat cct gaa cct tgc cca gat tct | | | 539 |
| Asn Gly Thr Gln Ile Tyr Val Ile Asp Pro Glu Pro Cys Pro Asp Ser | | | |
| 145 | 150 | 155 | 160 |
| gac ttc ctc ctc tgg atc ctt gca gca gtc agt tcg ggc ttg ttt ttt | | | 587 |
| Asp Phe Leu Leu Trp Ile Leu Ala Ala Val Ser Ser Gly Leu Phe Phe | | | |
| 165 | 170 | 175 | |
| tat agc ttt ctt atc aca gct gtt tct ttg agc aaa atg cta aag aaa | | | 635 |
| Tyr Ser Phe Leu Ile Thr Ala Val Ser Leu Ser Lys Met Leu Lys Lys | | | |
| 180 | 185 | 190 | |
| aga agc cct ctt acc aca ggg gtc tat gtg aaa atg ccc cca act gag | | | 683 |
| Arg Ser Pro Leu Thr Thr Gly Val Tyr Val Lys Met Pro Pro Thr Glu | | | |
| 195 | 200 | 205 | |
| cca gaa tgt gaa aag caa ttt cag cct tat ttt att ccc atc aat tga | | | 731 |
| Pro Glu Cys Glu Lys Gln Phe Gln Pro Tyr Phe Ile Pro Ile Asn | | | |
| 210 | 215 | 220 | |
| gagatcatta tgaagaagaa agaatatattt ccaatttcca ggagctgagg caattctaac | | | 791 |
| tttgtgctat ccagctatgt gtacttgttt gtatatatttg gggggggttt catctctctt | | | 851 |
| taatataaag ctggatgcag aaccctaatg aagtgtacta caaattcaaa gcaaagggtgc | | | 911 |
| aagaaaacag agccaggatg tttctgtcac atcagatcca attttcgtaa aagtatcact | | | 971 |
| tgggagcaat atggggatgc agcattagga catgcgctct aggatatagg ttagggagtg | | | 1031 |
| gtgcggtcca aagaaagcaa aggagagaga gtcagggaga ggatgatatt gtacacactt | | | 1091 |
| tgtatttaca tgtgagaagt ttatagctga agtgacgttt tcaagttaaa tttttgtgct | | | 1151 |

atgttatttt tcataaatgt aaaatcacgt gaagacttta aaaatattca catggctata 1211
 ttttagccag tgattccaaa gggtgtattg taccaatata tattttttta tctgatagta 1271
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 tatggcagtg tcttcccacc aggggctcag gggaagtgtt atggagggat tcaggacact 1391
 aatacgccag gtaaaataca aggtcacttg gtaactggct tggaaactgg atgagggtcat 1451
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 aagctctagt ttcacaaggg cccaattcc ttgctcatgg ttaatgccat gggcagaaaa 1691
 cagcagcagg tggcagaaca gggatgataa ggtttccgaa aacaaacact gttggtgttt 1751
 ttttaactca ctattttctg tgaaaatgca acaacatgta taatattttt aattaaataa 1811
 aaatctgtgg tggtcattaa aaaaaaaaaa aaaaaaaaaa aaaaa 1856

<210> 42

<211> 223

<212> PRT

<213> *Canis familiaris*

<400> 42

Met Ala Gly Phe Gly Phe Arg Arg His Gly Ala Gln Pro Asp Leu Ala
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Ser Arg Thr Trp Pro Cys Thr Ala Leu Phe Ser Leu Leu Phe Ile Pro
 20 25 30

Val Phe Ser Lys Gly Met His Val Ala Gln Pro Ala Val Val Leu Ala
 35 40 45

Ser Ser Arg Gly Val Ala Ser Phe Val Cys Glu Tyr Gly Ser Ser Gly
 50 55 60

Asn Ala Ala Glu Val Arg Val Thr Val Leu Arg Gln Ala Gly Ser Gln
 65 70 75 80

Met Thr Glu Val Cys Ala Ala Thr Tyr Thr Val Glu Asp Glu Leu Ala
 85 90 95

Phe Leu Asp Asp Ser Thr Cys Thr Gly Thr Ser Ser Gly Asn Lys Val
 100 105 110
 Asn Leu Thr Ile Gln Gly Leu Arg Ala Met Asp Thr Gly Leu Tyr Ile
 115 120 125
 Cys Lys Val Glu Leu Met Tyr Pro Pro Pro Tyr Tyr Val Gly Met Gly
 130 135 140
 Asn Gly Thr Gln Ile Tyr Val Ile Asp Pro Glu Pro Cys Pro Asp Ser
 145 150 155 160
 Asp Phe Leu Leu Trp Ile Leu Ala Ala Val Ser Ser Gly Leu Phe Phe
 165 170 175
 Tyr Ser Phe Leu Ile Thr Ala Val Ser Leu Ser Lys Met Leu Lys Lys
 180 185 190
 Arg Ser Pro Leu Thr Thr Gly Val Tyr Val Lys Met Pro Pro Thr Glu
 195 200 205
 Pro Glu Cys Glu Lys Gln Phe Gln Pro Tyr Phe Ile Pro Ile Asn
 210 215 220

<210> 43

<211> 1856

<212> DNA

<213> Canis familiaris

<400> 43

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 ttgttttcgg aaaccttcat caccctgttc tgccacctgc tgctgttttc tgcccatggc 180
 attaaccatg agcaaggaat tggggccctt gtgaaactag agcttccttg aagttcatac 240
 ctccaagact cctggaatga gccgtttact tgacgatggg gttctatgga gttaaatcag 300
 atataccagt ttgactccc ttacaaatct ttgaaaggag ctaacataaa agcccaaagc 360
 acatgtcaac accaatttag cccaacacgt ctacaagaat caactatgac ctcatccagt 420
 ttccaagcca gttaccaagt gaccttgtat tttacctggc gtattagtgt cctgaatccc 480

tccataaaac ttcccctgag cccctggtgg gaagacactg ccatatagtg tttatattga 540
aaccatcaac aaatacacaa aagcacatgt ggcccccatg cataatacta tcagataaaa 600
aaatataatat tgggtacaata caacctttgg aatcactggc taaaatatag ccatgtgaat 660
atTTTTaaag tcttcacgtg atTTTtacatt tatgaaaaat aacatagcac aaaaatttaa 720
cttgaaaacg tcacttcagc tataaacttc tcacatgtaa atacaaagtg tgtacaatat 780
catcctctcc ctgactctct ctcccttggc ttctttggac cgcaccactc cctaacctat 840
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ccctgtggtg agagggcttc ttttcttttag cattttgctc aaagaaacag ctgtgataag 1260
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gtaggggtgt ggggtacatga gctccacctt gcagatgtag agccccgtgt ccatggccct 1440
caacccttgg atggtgaggt tcactttggt tccactggag gtgccgggtgc aggtagaatc 1500
atccaggaag gccaaactcat cctccactgt gtatgtcgcg gcacagactt cagtcatctg 1560
gctgccagcc tgccgcagca ctgtcaccgc gacctgggt gcgttgctg aagaccata 1620
ttcacacacg aagctagcaa cccccgggt gctggccaga accactgcag gctgagccac 1680
atgcatccct ttggagaaga cggggataaa gagaagagaa aacagagcag tgcagggcca 1740
ggtcctagaa gccaggtccg gctgagcccc atgcctccg aatccaaagc cagccatggc 1800
tttatggagc agtggttcagg tcttcaggaa gcagagtga acctttcagg atcctg 1856

<210> 44

<211> 669

<212> DNA

<213> Canis familiaris

<400> 44

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 gctcagcctg cagtggttct ggccagcagc cgggggtgtg ctagcttcgt gtgtgaatat 180
 ggggtcttcag gcaacgcagc cgaggtccgg gtgacagtgc tgcggcaggc tggcagccag 240
 atgactgaag tctgtgccgc gacatacaca gtggaggatg agttggcctt cctggatgat 300
 tctacctgca ccggcacctc cagtggaaac aaagtgaacc tcaccatcca agggttgagg 360
 gccatggaca cggggctcta catctgcaag gtggagctca tgtaccacc accctactat 420
 gtaggcatgg gaaatggaac ccagatttat gtcatcgatc ctgaaccttg ccagattct 480
 gacttctcc tctggatcct tgcagcagtc agttcgggct tgttttttta tagctttctt 540
 atcacagctg tttctttgag caaaatgcta aagaaaagaa gccctcttac cacaggggtc 600
 tatgtgaaaa tgcccccaac tgagccagaa tgtgaaaagc aatttcagcc ttattttatt 660
 cccatcaat 669

<210> 45

<211> 669

<212> DNA

<213> Canis familiaris

<400> 45

attgatggga ataaaataag gctgaaattg cttttcacat tctggctcag ttgggggcat 60
 tttcacatag acccctgtgg taagagggtt tcttttcttt agcattttgc tcaaagaaac 120
 agctgtgata agaaagctat aaaaaaacia gcccgaaactg actgctgcaa ggatccagag 180
 gaggaagtca gaatctgggc aaggttcagg atcgatgaca taaatctggg ttccatttcc 240
 catgcctaca tagtaggggtg gtgggtacat gagctccacc ttgcagatgt agagccccgt 300
 gtccatggcc ctcaaccctt ggatggtgag gttcactttg tttccactgg aggtgccggt 360

gcaggtagaa tcatccagga aggccaactc atcctccact gtgtatgtcg cggcacagac 420
 ttcagtcatc tggctgccag cctgccgcag cactgtcacc cggacctcgg ctgcgttgcc 480
 tgaagaccca tattcacaca cgaagctage aacaccccgg ctgctggcca gaaccactgc 540
 aggctgagcc acatgcatcc ctttgagaaa gacggggata aagagaagag aaaacagagc 600
 agtgcagggc caggtcctag aagccaggtc cggctgagcc ccatgcctcc ggaatccaaa 660
 gccagccat 669

<210> 46
 <211> 1883
 <212> DNA
 <213> Felis catus

<220>
 <221> CDS
 <222> (69)..(740)

<400> 46
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 ataaagcc atg gct tgc ttt gga ttc cgg agg cat ggg gct cag ctg gac 110
 Met Ala Cys Phe Gly Phe Arg Arg His Gly Ala Gln Leu Asp
 1 5 10
 ctg gct tct agg acc tgg ccc tgc act gct ctg ttt tct ctt ctc ttt 158
 Leu Ala Ser Arg Thr Trp Pro Cys Thr Ala Leu Phe Ser Leu Leu Phe
 15 20 25 30
 atc ccc gtc ttc tcc aaa ggg atg cat gtg gcc cag cct gca gtg gtg 206
 Ile Pro Val Phe Ser Lys Gly Met His Val Ala Gln Pro Ala Val Val
 35 40 45
 ctg gcc agc agc cga ggt gtc gcc agc ttc gtg tgt gaa tat ggg tct 254
 Leu Ala Ser Ser Arg Gly Val Ala Ser Phe Val Cys Glu Tyr Gly Ser
 50 55 60
 tca ggc aat gcc gcc gaa gtc cga gtg act gtg ctg agg cag act ggc 302
 Ser Gly Asn Ala Ala Glu Val Arg Val Thr Val Leu Arg Gln Thr Gly
 65 70 75
 agc cag atg act gaa gtc tgt gct gcg aca tac aca gtg gag aat gag 350
 Ser Gln Met Thr Glu Val Cys Ala Ala Thr Tyr Thr Val Glu Asn Glu
 80 85 90

ttg gcc ttc cta gat gat tcc acc tgc act ggc atc tcc agc gga aac 398
 Leu Ala Phe Leu Asp Asp Ser Thr Cys Thr Gly Ile Ser Ser Gly Asn
 95 100 105 110

aaa gtg aac ctc acc atc caa ggg ttg agg gcc atg gac acg gga ctc 446
 Lys Val Asn Leu Thr Ile Gln Gly Leu Arg Ala Met Asp Thr Gly Leu
 115 120 125

tac atc tgc aag gtg gag ctc atg tac cca cca ccc tac tat gca ggc 494
 Tyr Ile Cys Lys Val Glu Leu Met Tyr Pro Pro Pro Tyr Tyr Ala Gly
 130 135 140

atg ggc aat gga acc cag att tat gtc atc gat cct gaa cct tgc cca 542
 Met Gly Asn Gly Thr Gln Ile Tyr Val Ile Asp Pro Glu Pro Cys Pro
 145 150 155

gat tct gac ttc ctc ctc tgg atc ctc gca gca gtc agt tca gga ttg 590
 Asp Ser Asp Phe Leu Leu Trp Ile Leu Ala Ala Val Ser Ser Gly Leu
 160 165 170

ttt ttt tat agc ttc ctt atc aca gct gtt tct ttg agc aaa atg cta 638
 Phe Phe Tyr Ser Phe Leu Ile Thr Ala Val Ser Leu Ser Lys Met Leu
 175 180 185 190

aag aaa aga agc cct ctt act aca ggg gtc tat gtg aaa atg ccc cca 686
 Lys Lys Arg Ser Pro Leu Thr Thr Gly Val Tyr Val Lys Met Pro Pro
 195 200 205

aca gag cca gaa tgt gaa aag caa ttt cag cct tat ttt att ccc atc 734
 Thr Glu Pro Glu Cys Glu Lys Gln Phe Gln Pro Tyr Phe Ile Pro Ile
 210 215 220

aat tga cacaccgtta tgaagaagga agaacactgt ccaatttcta agagctgagg 790
 Asn

caattctaac tttttgctat ccagctatgt tgcttatttg tgtattttgg ggggggattc 850

atctctcttt aatataaagc tggatgcaaa atccagatga agtgtactac aatttgaagc 910

aaagggtgcag gaaaacagag ccaggatggt tctgtcacat cagatccaat tttagtaaaa 970

gcatcactcg ggagcaatat agggatgcag tcttacgttg taggtgaagg atatgggtta 1030

gggggtggtg ctgtccaaaag aatacaaaagg aagagagtta gggagaggat gatattgtac 1090

acactttgta tttacacatg agaagtttat agctgaagtg atgttttcaa gttaaagttt 1150

tgtgctgtta tttttcttaa atgtggaatt acatgaagac tttaaaaata ctcacgtggc 1210
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 gtgtttttta actcattatt ttccatgaaa atgcaacaac atgtataata tttttaatta 1810
 aataaaaatc tgtggtggc aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1870
 aaaaaaaaaa aaa 1883

<210> 47
 <211> 223
 <212> PRT
 <213> Felis catus

<400> 47
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 20 25 30
 Val Phe Ser Lys Gly Met His Val Ala Gln Pro Ala Val Val Leu Ala
 35 40 45
 Ser Ser Arg Gly Val Ala Ser Phe Val Cys Glu Tyr Gly Ser Ser Gly
 50 55 60
 Asn Ala Ala Glu Val Arg Val Thr Val Leu Arg Gln Thr Gly Ser Gln
 65 70 75 80

Met Thr Glu Val Cys Ala Ala Thr Tyr Thr Val Glu Asn Glu Leu Ala
 85 90 95

Phe Leu Asp Asp Ser Thr Cys Thr Gly Ile Ser Ser Gly Asn Lys Val
 100 105 110

Asn Leu Thr Ile Gln Gly Leu Arg Ala Met Asp Thr Gly Leu Tyr Ile
 115 120 125

Cys Lys Val Glu Leu Met Tyr Pro Pro Pro Tyr Tyr Ala Gly Met Gly
 130 135 140

Asn Gly Thr Gln Ile Tyr Val Ile Asp Pro Glu Pro Cys Pro Asp Ser
 145 150 155 160

Asp Phe Leu Leu Trp Ile Leu Ala Ala Val Ser Ser Gly Leu Phe Phe
 165 170 175

Tyr Ser Phe Leu Ile Thr Ala Val Ser Leu Ser Lys Met Leu Lys Lys
 180 185 190

Arg Ser Pro Leu Thr Thr Gly Val Tyr Val Lys Met Pro Pro Thr Glu
 195 200 205

Pro Glu Cys Glu Lys Gln Phe Gln Pro Tyr Phe Ile Pro Ile Asn
 210 215 220

<210> 48
 <211> 1883
 <212> DNA
 <213> Felis catus

<400> 48
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 agttaaaaaa caccaacagt gtagttttt agaaactttc atcaccctgt tctgccaccg 180
 gctgcttttt tctgtccatg gcatgaacca tgtgttagga attggggccc ttgtgaaact 240
 agagcttcct tgaagttcgt acctacaaga ccctggagt gagccatttt cttgagggtg 300
 gtgttctatt gaattacatc agatacacca gtctggactc ctttgcaaac ctttgaaagg 360
 agctaacata aaagcccaa tcacatgtca acaccaattc agctcaacgt gtctataaga 420

atcagttatg acctcagcca gttccaagc cagttaccaa gtgactttgt gttctacctg 480
gtgtattagt gtcctgagcc cctccataaa acttcccctg aacccatggt gggaagacac 540
tgccatatag tgtttatatt aaaacatca gcaaatacac aaaagcacat gtggtcccca 600
tgcacaatac tatcaaataa aaaaaatac atattggtac aatacaacct ttggaatcac 660
tggctaaaat atagccacgt gagtattttt aaagtcttca tgtaattcca catttaagaa 720
aaataacagc acaaaacttt aacttgaaaa catcacttca gctataaact tctcatgtgt 780
aaatacaaag tgtgtacaat atcatcctct ccctaactct ctccctttgt attctttgga 840
cagcaccacc ccctaacca tctccttcac ctacaacgta agactgcac cctatattgc 900
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gccagtgcag gtggaatcat ctaggaaggc caactcatc tccactgtgt atgtcgcagc 1560
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cactgcaggc tgggccacat gcatccctt ggagaagacg gggataaaga gaagagaaaa 1740
cagagcagtg cagggccagg tcctagaagc caggtccagc tgagcccat gcctccggaa 1800
tccaaagcaa gccatggctt tatgggagca gtgttcaggt cttcaggaag cagagtgaaa 1860

cctttcagga tcctgaagct ttg

1883

<210> 49

<211> 669

<212> DNA

<213> Felis catus

<400> 49

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gccagacctg cagtgggtgct ggccagcagc cgaggtgtcg ccagcttcgt gtgtgaatat 180
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669

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<211> 669

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<213> Felis catus

<400> 50

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Primer

<400> 51

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<210> 52

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34

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<212> DNA

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22

<210> 56

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<210> 57

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28

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35